

### III. AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of forming a freestanding semiconductor layer, comprising the steps of:

- a) forming a non-monocrystalline mandrel on a monocrystalline base structure;
- b) forming a conformal polycrystalline semiconductor layer on at least one sidewall of the mandrel, the polycrystalline layer contacting the monocrystalline base structure; and
- c) recrystallizing the polycrystalline semiconductor layer to have a crystallinity substantially similar to that of the base structure.

2. (Currently Amended) The method of claim 1, wherein the step of forming a conformal polycrystalline semiconductor layer b) further comprises the steps of:

- b1) depositing the polycrystalline semiconductor layer on the base structure and the mandrel; and
- b2) selectively removing a portion of the polycrystalline semiconductor layer, wherein a remaining portion of the polycrystalline layer contacts at least one sidewall of the mandrel and the base structure.

3. (Currently Amended) The method of claim 1, wherein the step of forming a conformal polycrystalline semiconductor layer b) further comprises the steps of:

- b1) growing the polycrystalline semiconductor layer on the base structure and the mandrel; and
- b2) selectively removing a portion of the polycrystalline semiconductor layer.

4. (Currently Amended) The method of claim 1, wherein the step e) of recrystallizing the polycrystalline semiconductor layer further comprises the steps of:

- c1) removing the mandrel; and
- c2) recrystallizing the polycrystalline semiconductor layer through annealing.

5. (Currently Amended) The method of claim 1, wherein the step e) of recrystallizing the polycrystalline semiconductor layer further comprises the steps of:

- c1) recrystallizing the polycrystalline semiconductor layer through annealing; and
- c2) removing the mandrel.

6. (Original) The method of claim 1, further comprising the step of:  
providing an insulating layer.

7. (Currently Amended) The method of claim 6, wherein the step a) of forming a non-monocrystalline mandrel further comprises the steps of:

- a1) forming the base structure on the insulating layer;
- a2) depositing the mandrel on the insulating layer and the base structure;
- a3) planarizing the mandrel to the base structure; and
- a4) selectively removing a portion of the mandrel and the base structure from the insulating layer.

8. (Currently Amended) The method of claim 6, wherein the step a) of forming a non-monocrystalline mandrel further comprises the steps of:

- a1) forming ~~the~~ an insulator material on the monocrystalline base structure;
- a2) forming at least one aperture in the insulator material; and
- a3) forming the non-monocrystalline mandrel on the insulator material and on the base

structure, wherein the mandrel contacts the base structure through the at least one aperture.

9. (Currently Amended) The method of claim 8, wherein the step of forming a conformal polycrystalline semiconductor layer b) further comprises the step of:

- b1) forming the semiconductor layer on the base structure through the at least one aperture.

10. (Original) The method of claim 6, wherein the insulator layer and the base structure form a silicon-on-insulator wafer.

11. – 15. (Cancelled)

16. (Currently Amended) A method of forming a field-effect transistor having at least one freestanding semiconductor layer comprising the steps of:

- a) forming a non-monocrystalline mandrel on a monocrystalline base structure;
- b) forming a conformal polycrystalline semiconductor layer on at least one sidewall of the mandrel, the polycrystalline layer contacting the monocrystalline base structure;
- c) recrystallizing the polycrystalline semiconductor layer to have a crystallinity substantially similar to that of the base structure;
- d) removing the mandrel; and
- e) forming a gate structure on the semiconductor layer.

17. (Currently Amended) The method of claim 16, wherein the step of forming a conformal polycrystalline semiconductor layer ~~b)~~ further comprises the steps of:

b1) depositing the polycrystalline semiconductor layer on the base structure and the mandrel; and

b2) selectively removing a portion of the polycrystalline semiconductor layer, wherein a remaining portion of the polycrystalline layer contacts at least one sidewall of the mandrel and the base structure.

18. (Currently Amended) The method of claim 16, wherein the step of forming a conformal polycrystalline semiconductor layer ~~b)~~ further comprises the steps of:

b1) growing the polycrystalline semiconductor layer on the base structure and the mandrel; and

b2) selectively removing a portion of the polycrystalline semiconductor layer.

19. (Currently Amended) The method of claim 16, wherein the step a) of forming a non-monocrystalline mandrel further comprises the steps of:

a1) providing an ~~insulator~~ insulating layer;

a2) forming the base structure on the insulating layer;

a3) depositing the mandrel on the insulating layer and the base structure;

a4) planarizing the mandrel to the base structure; and

a5) selectively removing a portion of the mandrel and the base structure from the insulating layer.

20. (Currently Amended) The method of claim 16, wherein the step a) of forming a non-monocrystalline mandrel further comprises the steps of:

- a1) providing an insulator material;
- a2) forming the insulator material on the monocrystalline base structure;
- a3) forming at least one aperture in the insulator material; and
- a4) forming the non-monocrystalline mandrel on the insulator material and on the base structure, wherein the mandrel contacts the base structure through the at least one aperture.

21. (NEW) A method of forming a freestanding semiconductor layer, comprising the steps of:

- a) forming a non-monocrystalline mandrel on a monocrystalline base structure;
- b) forming a conformal polycrystalline semiconductor layer on at least one sidewall of the mandrel, the polycrystalline layer contacting the monocrystalline base structure;
- c) growing the polycrystalline semiconductor layer on the base structure and the mandrel;
- d) selectively removing a portion of the polycrystalline semiconductor layer;
- e) recrystallizing the polycrystalline semiconductor layer to have a crystallinity substantially similar to that of the base structure; and
- f) removing the mandrel.

22. (NEW) The method of claim 21, wherein the step of forming a conformal polycrystalline semiconductor layer further comprises the steps of:

- b1) depositing the polycrystalline semiconductor layer on the base structure and the mandrel; and
- b2) selectively removing a portion of the polycrystalline semiconductor layer, wherein a remaining portion of the polycrystalline layer contacts at least one sidewall of the mandrel and the base structure.

23. (NEW) The method of claim 21, further wherein the step of recrystallizing the polycrystalline semiconductor layer is via annealing.
24. (NEW) The method of claim 21, further comprising the step of:  
providing an insulating layer.
25. (NEW) The method of claim 24, wherein the step of forming a non-monocrystalline mandrel further comprises the steps of:
- a1) forming the base structure on the insulating layer;
  - a2) depositing the mandrel on the insulating layer and the base structure;
  - a3) planarizing the mandrel to the base structure; and
  - a4) selectively removing a portion of the mandrel and the base structure from the insulating layer.